

Rachel Carson National Wildlife Refuge

Wells, Maine

Annual Narrative



Calendar Year 2003

**U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM**

REVIEW AND APPROVALS

RACHEL CARSON NATIONAL WILDLIFE REFUGE

Wells, Maine

ANNUAL NARRATIVE

Calendar Year 2003



Refuge Manager

6/2/06

Date

Refuge Supervisor Review

Date

Regional Office Approval

Date

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A. HIGHLIGHTS

The National Wildlife Refuge System Centennial (March 14, 1903 – March 14, 2003) was a year long joyous celebration of who we are, what we do, what we have accomplished and where we are going. The Centennial message was a part of every news release, press contact and public speech. The refuge was the only Maine stop part of the R5 Centennial Bus Tour in March.

Rachel Carson and Parker River National Wildlife Refuges hired the second Land Management Research and Demonstration biologist in the System. Salt Marsh ecologist Dr. Susan Adamowicz hit the ground running and published (previously researched) works within the first month of her appointment

Personnel changes are always very important on the refuge; people are how we get the work done. The refuge's ranks changed as follows this year:

Kathie Morris	Administrative Assistant	EOD: April 21, 2003
Scott Olsen	Recreational Aide	EOD March 5, Resigned April 17
Deborah Kendall	Biological Technician	EOD May 5, Resigned August 2
Susan Bloomfield	Outdoor Recreation Planner	Resigned September 6, 2003
Susan Adamowicz	Wildlife Biologist	EOD August 24, 2003

Susan Bloomfield is pursuing a Masters degree in Library Science. Scott and Deborah both left for more permanent positions with other agencies.

The refuge enjoyed a very successful YCC program this summer. Five enrollees and rotating leaders removed invasive species, cleared trail, built an observation platform and maintained roads and grounds.

The refuge entered into a cooperative agreement with Wells National Estuarine Research Reserve to restore a more natural hydrology to Drakes Island marsh. The project will include the first self-regulating tidal gate in Maine.

Rachel Carson Refuge and the North American Wildlife Management Program cooperatively are supporting the Mt. Agamenticus to the Sea conservation initiative by partially funding the coordinator for this 10-member group.

The Trust for Public Land and the refuge purchased a highly important tract in the Mousam Division near Parson's Beach. The mixed bluff and coastal sand plane habitat includes a large bog and is surrounded by largely undeveloped coastal lands

Wetland restoration work at the 52 acre Biddeford Pool site was completed and seven plugged ditches were rehabilitated this year. The rehab work was accomplished in a day.

The refuge provided a tour of several sites on the refuge to the FWS Deputy Directors in October.



Looking at fish from salt marsh.



Kate O'Brien discussing phragmites control at RCNWR

The refuge lost a valuable friend and supporter on October 13. Bill Siliker Jr. passed away while on a photography trip to Maine's Baxter State Park. Bill was one of the founding members and first President of the Friends of Rachel Carson NWR.

B. CLIMATIC CONDITIONS

The refuge is located along the southern coast of Maine and, as a result, weather conditions are moderated by the proximity of the ocean. Weather data is obtained from the FWS-11 Fire Weather Station located in the Moody Division of the refuge in Wells, Maine. Normal data is based on NWS observations at the Portland, ME Jetport 1961-1999.

Table B-1 below summarizes 2003 temperatures (degrees Fahrenheit) and precipitation (inches) for the refuge.

Table B-1

Month	Temperatures		Rainfall		Snowfall	
	Maximum	Minimum	Normal	2003	Normal	2003
January	39	-12	3.09	1.14	20.5	18.7
February	51	-17	3.14	3.51	12.8	16.8
March	58	-2	4.14	3.65	13.0	2.4
April	83	19	4.26	3.20	3.4	4.5
May	80	32	3.82	3.13	T	0
June	89	41	3.28	2.15	-	-
July	92	50	3.32	1.50	-	-
August	91	46	3.05	2.10	-	-
September	78	41	3.37	4.68	T	-
October	71	26	4.40	5.60	0.4	T
November	74	18	4.72	3.06	3.2	T
December	52	7	4.24	4.54	14.3	24.0

* Incomplete data, weather station in for annual service.

C. LAND ACQUISITION

1. Fee Title

The refuge acquired 5 tracts of land during 2003:

Tract 217	Upper Wells division	34.97 acres	LWCF
Tract 4551	Little River division	3.05 acres	LWCF
Tract 4500	Little River division	3.2 acres	LWCF
Tract 406	Goose Rocks division	0.46 acres	LWCF
Tract 457	Goosefare Brook division	0.04 acres	LWCF

According to Realty, at the end of 2003 the refuge was 5,184.23 acres in size which is approximately 69 percent of the 7,500 acre approved acquisition boundary.

2. Easements

The refuge administers one FmHA easement, the 80 acre Gillespie Farm in North Yarmouth.

3. Other

The Preliminary Project Proposal, approved in 1999, continues to be refined. Regional Office staff met with refuge staff to visit proposed acquisition areas to refine proposed boundaries. Data was collected for ownership within the proposed units and the LPP was being drafted. A presentation of the proposal was given to the Regional Chief and others in July at which time additional information was requested to support the proposal. The completion and approval of the LPP, and CCP, did not happen in 2003. Being optimistic, perhaps 2004 will be more successful.

D. PLANNING

1. Comprehensive Conservation Plan

The Comprehensive Conservation Plan (CCP) process is in its sixth year, the refuge published its intention to plan in the Federal Register in September, 1997. Outdoor Recreation Planner Susan A. Bloomfield, continued to be a tireless worker on this complicated project right up to the time she resigned in September this year. Regional chief planner Norm Olson shepared the plan from the Regional Office with several trips to the refuge up until his retirement this fall.

The refuge draft, completed in 2001, was reviewed by Refuge Chief Tony Leger and others at a July 7 briefing in the Regional Office. The refuge's assignment is to review the comments from this briefing and incorporate them into the plan. In November, Regional Biologist Janith Taylor and Kate O'Brien revised some wording on goals to make them more specific and obtainable; these, too, must be incorporated into the larger document with changes to the matrix, alternatives, etc. The Regional Office has assigned a specialist, Carl Melberg, to move the project forward. This is very exciting, Carl is the first regional planner assigned to the Rachel Carson NWR CCP (although Norm was immensely helpful from his chief's position).

The Land Protection Plan (LPP) was modified throughout the year. Cartography worked with contract employee Roger Cole to assemble the parcel information from 5 towns. The LPP recommends the addition of 5,500 acres of indispensable habitat to the refuge boundary. The LPP recommended lands identified in the Preliminary Project Proposal signed by the Service director in December 1999 and represent the manageable portions of the Important Habitats of Southern Maine GIS effort.

2. Management Plan

A Habitat Management Plan (HMP) working group was formed in 2003. Refuges in the Gulf of Maine watershed, along with the Silvio Conte Refuge, formed a group to start writing the plan collectively. RRB Jan Taylor spearheaded the effort, and contracted with Ellen Snyder to write

sections of the plan with guidance from the field. The group met once in 2003 and also held one conference call. WB O'Brien is team leader for the coastal subgroup and RM Taylor and LMRD Adamowicz are participating in the working group process and are also on the coastal subgroup

3. Public Participation

Scoping efforts continue for the Comprehensive Conservation Plan. The refuge has taken advantage of Centennial celebration events to keep up interest in the plan and solicit input. As our plan changes, such as rewording goals, we check with individuals and organizations to keep them current on our progress and incorporate their input into this dynamic document.

4. Compliance with Environmental and Cultural Resource Mandates

The State Historic Preservation Office (SHPO) had requested that the Refuge provide documentation of existing features of salt marsh ditches within the Little River and Mousam River marshes in Kennebunk. Under the direction of staff archaeologists from the RO, the ditches were measured, photographed and located using GPS. Data including GIS information of the ditches along with ground and aerial photographs were provided to the SHPO office. At the end of the year we are still waiting for approval to move forward with restoration of the marshes.

The refuge has an active recycling and greening program. During the year we purchased a bi-fuel pickup which uses gasoline and propane. We also ordered a hybrid gasoline/electric Honda Civic that will be used by the new LMRD biologist. At the end of the year we were looking into replacing a 1988 pickup with a diesel pickup. There is a local source of bio-diesel and we will also be using the fuel in our equipment as well.

The YCC constructed an observation platform overlooking an area of the Mousam River using plastic lumber products as much as possible. The walkway from the trail will be constructed next year with similar materials.

5. Research and Investigations

Salt Marsh Restoration Monitoring

In 2001, USGS began a multi-refuge research project to examine the effects of ditch plugging. This work built on the original research conducted by Dr. Charles Roman (USGS-BRD, URI) and Dr. Susan Adamowicz (URI), who monitored salt marsh restoration sites at three locations on Rachel Carson NWR. Dr. Roman continued this work throughout a portion of 2002 and then left the project to take a new position with the National Park Service. The multi-refuge project is being continued by Dr. Mike Erwin (USGS-BRD), University of Rhode Island and LMRD Biologist Adamowicz.



LMRD Biologist preparing to sample fish.

Bird surveys continued in 2003 at Granite Point. Damaged ditch plugs which were repaired.

Sediment Elevation Tables (SET's) at Granite Point and Moody were read by staff, Jim Lynch (USGS) and Dr. Roman (NPS). Initial SET results indicate no change or a decrease in elevation, although it is too early to establish any trend. Feldspar markers in conjunction with cryogenic cores indicated sites had a similar rate of deposition (~ 1.8 mm/yr).

Drakes Island

The Wells Reserve in conjunction with doctoral student Ray Konisky initiated a study to restore tidal flow to Drakes Island Marsh. Plans were developed for the site and USFWS supports those plans. Refuge staff and Dr. Ray Konisky worked to develop a monitoring plan for 2004.



Photo: Aerial view of Drakes Island Marsh.

Point Count Landbird Study

The Goosefare Brook and Spurwink land bird routes were surveyed once by George Gavutis for the fourth consecutive year. WB O'Brien conducted an analysis of data collected and drafted a report documenting average frequency and abundance of all bird species detected using the landbird point count survey methodology

It had been five years since the Brave Boat Harbor and Upper Wells Routes were surveyed. Scott Crowenworth revisited those points and re-surveyed each route twice. This data will be analyzed in 2004.

New England Cottontail

Dr. John Litvaitis finalized work on the Ecoteam funded project "Assessing the Status of New England Cottontail and Identifying Areas for Habitat Enhancement for lands at Rachel Carson National Wildlife Refuge". The final report, "Status of New England Cottontails within the Rachel Carson National Wildlife Refuge" was received in July. This report documented habitat patches occupied by the cottontail and recommended areas to manage for cottontail. Areas in the Spurwink Division and the Wells Divisions were identified for management. In September, we applied again for the USGS Science Support Partnership grant. The grant proposal was not funded for a second year in a row.

Horseshoe Crab Scouting Surveys

Sue Schaller and Peter Thayer began a project to document horseshoe crab spawning and habitat usage at several sites in Maine. Anecdotal evidence suggests populations are decreasing. Out of 17 sites surveyed from Goosefare Brook in Saco to Spruce Creek in Kittery only 2 shells were located. Evidence of usage was found at 7 out of 18 more northern sites. They found many areas of habitat which appeared to be suitable, but were not occupied by horseshoe crabs. Additional monitoring is necessary to determine if populations are decreasing.

Invertebrate Life History in Spurwink River

Professor Michael Mazurkiewicz from the University of Southern Maine continued to study invertebrate life histories at the Spurwink salt marsh. In 2003, he conducted two trips during the month of October with students from his field ecology course. The trips were to salt marsh pools adjacent to Sawyer Road. Using dip nets, they searched for the sea anemone, *Nematostella vectensis* and its major prey species, the snail *Hydrobia truncata*, both of which were abundantly present (in the case of *Hydrobia truncata*, up to 300,000 individuals per square-meter may be present as previously noted in his report for 2000). Specimens were collected, brought to the laboratory for observations on the feeding behavior of the anemone, and then returned to the pools.

Grassland Breeding Bird/Prescribed Fire Study

Rachel Carson NWR completed the third and final year of a three-year USGS study examining the impact of prescribed burning on grassland nesting birds. This was an important study to participate in due to our interest in early successional habitat. None of our current holdings met the field size criteria (30+ acres). The refuge paired up with The Nature Conservancy (TNC) and used the Kennebunk Plains site for the study. This year, contract botanist Joann Hoy, volunteer

Nancy McReel and refuge staff collected extensive vegetation data in June and in August. Double observer point count surveys were conducted by biological technician Nancy Williams and contract birder Bill Lee.

Malformed Frog Study

Dr. Kim Babbitt and her graduate student Lisa Plagge sampled the Brown Street Impoundment for malformed amphibians. Two site visits were conducted and a total of seventy-one green frogs (*Rana clamitans*) were collected. Four of these metamorphs displayed abnormalities.

New England Wild Flower Society/Maine Plant Conservation Volunteers

For the second year, ORP Bloomfield and WB O'Brien participated in the Maine Plant Conservation Volunteer program sponsored by the New England Wild Flower Society. With the assistance of volunteers Nancy McReel and David Tibbetts, the effort focused on checking on the status of many older Natural Areas records. The Stevens Brook Marsh site was checked in 2002 for the presence of *Iris prismatica* and it was not found. In 2003 it was rechecked by David Tibbetts and 12 flower stems were recorded. Godfrey's Cove in York was checked for *Chenopodium rubrum* and the plant was not found.

Wells Harbor Dredge Impact Study

Woodlot Alternatives continues to monitor salt marsh accretion and/or erosion related to Wells Harbor dredging activities and salt marsh restoration.

Deer Tick Study

A Special Use Permit was issued to Dr. Rand and Charles Lubelczyk from the Maine Medical Center to conduct research on deer ticks, habitat correlations and Lyme disease, at the Brave Boat Harbor Division. Three grids in three different habitat types were set up for small mammal trapping purposes. Mammals were trapped using Sherman traps, tagged and immediately released. A total of 735 trap nights were recorded. *Peromyscus leucopus / maniculatus* (white footed or deer mice), *Clethrionomys gapperi* (boreal red-backed vole), *Tamias striatus* (eastern chipmunk), *Glaucomys volans* (southern flying squirrel) and *Blarina brevicauda* (short-tailed shrew) were detected. *I. dammini* and *Dermacentor variabilis* ticks were collected and were analyzed for Lyme disease infection rates. In addition to the study by Maine Medical, 100 ticks were collected and sent to researchers at the University of Indiana for an examination of microbial communities within the tick population.

Fire Management Options for Controlling Woody Invasive Plants in the Northeastern and Mid-Atlantic United States

No report filed for work in 2003. The majority of the work was conducted and reported in 2002. A final report is expected in 2004.

Assessment of Factors Endangering the Least Tern in Maine and Development of Management Strategies

University of Maine graduate student Jordan Perkins, and her advisor, Dr. Fred Servello completed the final year of a two year study documenting limiting factors and identifying

management actions for least terns in Maine. The study objectives include documenting productivity and nesting ecology, determining limiting factors for nest success and fledging rates, examining historic habitat factors and tern occupancy rates, conducting a population analysis to evaluate least tern management strategies and providing management recommendations. (See least tern section for 2003 results). The final report will be completed in 2004.

Effects of Tidal Restrictions on Fish Use of Salt Marshes in Southern Maine.

University of New Hampshire graduate student Alyson Eberhardt completed her second year of fish sampling at Drake's Island marsh and at four other sites. Data suggests tidally restricted marshes impair movement of fish and, that given unrestricted access; *Fundulus heteroclitus* expresses some site fidelity. It also suggests that culvert size and flow rate restrict movement of fish in tidally restricted systems.

Understanding Shifting Wetland Community Organization and Diversity along Salinity Gradients: the Roles of Physical Stress and Competition.

Brown University graduate student Caitlin Mullan completed her third and final year of field work at the Branch Brook marsh. Her research has uncovered significant results about the role of an ecosystem engineering tussock sedge as a major community driver in these low salinity marshes. A final report is expected in 2004.

Ecological Processes, Energy Pathways, and the Impact of Human Activities on Maine Marsh-Estuarine Secondary Production: a salt marsh panne model. Dr. Rich MacKenzie completed his second year of this Maine Sea Grant project. Four treatments were installed, with three replicates each. The treatments included, one where fish were limited to panne habitat only, one where fish were limited to panne and a small portion of marsh habitat, one where fish could move freely, and a procedural control where an enclosure was erected around the panne, but off of the marsh surface so fish could move freely. A stable N 15 isotope marker was added to pannes to enable tracking of energy pathways. Fish, invertebrates, sediments, algae plants and plankton were all sampled and are being analyzed. Dr. MacKenzie left to take another position in the fall. The status of this project is unknown.

Northeast Amphibian Research and Monitoring Initiative Vernal Pool Study This is the third year Dr. Robin Jung's USGS study has taken place on the refuge. The refuge was given a small amount of funding to implement the project and WB O'Brien and ORP Bloomfield completed the field work. Focal pools were located off of Short Farm Road in Kittery, Brown Street in Kennebunk, Route 9 in Kennebunkport and near Branch Brook in Kennebunk. Dr. Jung requested we find a new vernal pool in 2004 to replace the Biddeford site. Spotted salamander and wood frog egg masses were identified in all focal pools. Pools were surveyed a total of four times in the spring.

Latitude and Herbivory in Saltmarsh Habitat. Dr. Steven Pennings from the University of Houston, began research to examine geographic variation in patterns of herbivory. The Rachel Carson National Wildlife Refuge was one of 20 sites studied, 10 in the northeast and 10 in the southeast. *Spartina alterniflora* plants were placed in the marsh in plastic pots for 30 days to assess herbivore damage. Following the experiment, plants were removed and destroyed, and

holes were filled with the original peat plugs that had initially been removed. Initial results suggest a strong pattern for plant-herbivore interactions to be more intense at low-latitude versus high-latitude sites.

Vernal Pool Plant Study

David Tibbetts completed this study as a portion of his work to complete a certificate in native plant studies from the New England Wildflower Society. Plants surrounding two vernal pools at the Brave Boat Harbor were surveyed. Interesting findings include buckthorn invading the understory and vernal pool edges where winterberry currently exists, viburnum beetle damage to native arrow wood, and several rare plants (Common White Heartleaf Aster S3/G5, Pale Green Orchid S2/G4). Herbarium samples were also provided to the refuge.

Hemlock Woolly Adelgid Study

Don Oullette, Maine Forest Service requested permission to sample Rachel Carson NWR for hemlock woolly adelgid and possibly identify a study site to track the infestation. The insect has been documented on Gerrish Island and is likely to spread to the Brave Boat Harbor Division. It is unknown if the adelgid can survive long cold Maine winters. A progress report is pending as field work continued into 2004.

Electrical Resistance Coring Transects

Dr. Belknap and his graduate student Allen Gontz used electrical resistance methods along coring transects to test the efficiency of using electrical resistance to delineate changes in subsurface soil properties in salt marshes on the Upper Wells Division. In 2003, the resistance equipment failed. However, the limited data they did gather seemed to indicate that this method could be successful in profiling sub-surface soil properties and could detail historical marsh features such as old tidal streams, salt pannes, low and high marsh peat and other paleo-marsh surface features. They intend to resurvey the area with repaired equipment in 2004.

6. Other

DRM Taylor continued to serve as the R5 representative to the Centennial Conference Steering Committee. The committee met twice early in the year and held several conference calls until the committee was dissolved in May after the Centennial Commission failed to secure the funding needed to hold the event that was taking shape through the work of the Day teams and Steering Committee.

E. ADMINISTRATION

1. Personnel

1. Ward Feurt, Project Leader, GS-13, PFT, EOD 9/18/95
2. Graham W. Taylor, Deputy Refuge Manager, GS-12, PFT, EOD 6/24/93.
3. Susan A. Bloomfield, Outdoor Recreation Planner, GS-11, PFT, resigned 9/6/03
4. Kathie Morris, Administrative Assistant, GS-5, PFT, 4/21/03

5. David Melvin, Maintenance Worker, WG-7, PFT, EOD 6/18/00.
6. Kate O'Brien, Wildlife Biologist, GS-11, PFT, EOD 9/10/00.
7. Sue Adamowicz, Wildlife Biologist-LMRD, GS-12, PFT, EOD 8/24/03
8. Mark Kerr, Forestry Technician, GS-6, CS, EOD 4/7/01.
9. Robin Stanley, Forestry Technician, GS-4, CS, EOD 6/2/02.
10. Bob Harris, Regional WUI Coordinator, GS-11
11. Nancy Williams, Biological Technician, GS-5, TFT, 4/28/03-8/20/03.
12. Lucy Burnell, Biological Technician, GS-5, TFT, 4/28/03-8/15/03.
13. Scott Olsen, Recreational Aide, GS-4, TPT, 3/5/03-4/17/03
14. Deborah Kendall, Biological Technician, GS-5, TFT, 5/4/03-8/2/03
15. Josephine Powers, Administrative Intern
16. Nate Duchlos, Summer Intern –YCC leader
17. Rachel Marlett, Summer Intern – Environmental Education
18. Lindsay Wagner, Summer Intern – Biological
19. Kate Ostregen, Invasive Species Intern
20. Elizabeth Quinn, YCC Enrollee – Youth Leader
21. Jeremy Chunn, YCC Enrollee
22. Colette Forte, YCC Enrollee
23. William Hardy, YCC Enrollee
24. Danna-Lea Swanson, YCC Enrollee



Left to Right: 9, 10, 1, 8, 3, 6, 5, 2, 13.

2. Youth Programs

This year Rachel Carson hosted a second very successful Youth Conservation Corps program. The employees worked eight weeks in July and August with their major emphasis on invasive species removal, mainly glossy buckthorn. Returning youth leader Elizabeth Quinn provided some continuity for the group which helped with finding tools, work ethic and interactions with the staff. Liz was joined by William Hardy, Colette Forte, Danna-Lea Swanson, and Kyle Chunn; five enrollees from five towns. Two leaders split the season, Nate Duclos and Jo Powers, with refuge staff directing work on other days.

The group's first project, removing invasive plant species from the Headquarters and Houston House sites, began on the very first day. Invasive plant technician Deborah Kendall and Intern Lindsay Wagner were instrumental in teaching the YCC enrollees how to identify the invasive species that needed to be removed, as well as the best ways to remove them. The YCC enrollees quickly became experts in invasive species identification. Over the course of the two month season, YCC enrollees worked hard to remove invasive species from Headquarters, Salt Marsh Circle, and the Houston property. Additionally, lawn mowing and yard upkeep were accomplished at Headquarters and the Houston property on a bi-weekly basis.

Over the course of the season, the enrollees brushed out the length of the Cutts Island Trail, brushed in all of the spur trails, defined the trail in numerous areas with logs, pinned logs with rebar staples, put in a small bog bridge, installed color-coded Trail-Lite markers, and constructed, painted, and erected wooden signs, each with a map and trail rules, in four distinct areas of the trail.

At the Mousam Division Bridle Path Trail, the YCC constructed, with the help of Maintenance Worker David Melvin, an observation platform, with railing, at the mid-point of the trail. The platform overlooks the Mousam River at a point where many shorebirds feed. YCC members learned basic carpentry skills, and how to properly and safely use tools. David, throughout the season, did an exceptional job of teaching the YCC enrollees many different of skills.

The YCC enrollees built four new piping plover exclosures, retrieved all the equipment and signs from the beach at the end of the season, thoroughly cleaned and organized the equipment, and stored it away for the season. Additionally, plover technician Lucy Burnell had help from the crew, and they learned how we monitor and manage the threatened piping plovers.

YCC completed a number of other projects at headquarters including fence repairs, extending stockade fencing, installation of drainage pipes, trash removal and recycling, painting, and brushing out and maintaining the Rachel Carson Trail. Trash cleanup, on a number of refuge sites, was regularly part of the YCC workload. The Mousam River area, Brown Street, and Goosefare Brook were thoroughly cleaned of trash and debris. The headquarters' offices and bathrooms, and the field sub-headquarters, were cleaned on a weekly basis. YCC enrollees removed pine needles, straw, and leaves from the Rachel Carson Trail, cleaned the trail of trash and debris on a weekly basis, and repaired the hand rail in several locations. The crew topped off branches that were blocking the views at the overlooks on the Rachel Carson Trail.

In addition to the work accomplished by the YCC for Rachel Carson National Wildlife Refuge, the enrollees' services were also utilized by other organizations. The Wells Reserve, The Nature Conservancy, and Great Bay National Wildlife Refuge were all beneficiaries of the Youth Conservation Corps Program. The YCC conducted shoreline surveys on three separate occasions with the Wells Reserve. The Nature Conservancy (TNC) supervised the YCC in the removal of a large wooden fence co-owned by the TNC and Rachel Carson, and the enrollees helped remove invasive purple loosestrife from TNC's Beach Plum Farm. The Parker River YCC crew and Rachel Carson's enrollees worked together at Great Bay NWR. YCC completed a number of projects for Great Bay National Wildlife Refuge including shoreline cleanup on large sections of beaches, removal of invasive species, filling in ruts with sand on a mile long stretch of trail, and sorting and boxing remaining pants that will be mailed to Fish and Wildlife's sister organizations in Russia.

Youth Conservation Corps enrollees learned valuable work skills and gained environmental knowledge in the process of completing important conservation work. Leader Dulcos shared his visitor program information with the enrollees. Some days were just about YCC learning. YCC members visited Wells Reserve and learned a bit about ornithology and bird banding. They also visited the Maine Wildlife Park and Bradbury Mountain State Park. It was a very successful summer.

4. Intern/Volunteer Program

Intern Program

Rachel Marlett, Lindsay Wagner, Nathan Duclos, Josephine Power, Kate Ostergren all worked for the refuge in various intern positions. Rachel is from Wisconsin and worked during the summer as our outreach intern. Lindsay is from New Jersey and provided valuable assistance to the biological program. Nate is from New Hampshire and worked very well with the YCC program as their leader until his departure. Josephine Power is from Maine and provided assistance as not only leading the YCC after Nate left, but also assisting with administrative duties while Kathie was out on workers comp. Kate Ostregren returned to us late in the year to assist with the invasive species program including planning for the invasive species workshop and mapping invasives on the refuge.

Volunteer Program

Volunteers contributed 2,399 hours to the refuge by assisting staff with a variety of surveys including piping plover, least tern, rare plants, shorebirds, vernal pools, and osprey.

The refuge again participated in the United Way "Day of Caring" community volunteering project in June. Two individuals provided 12 hours and assisted with spring cleaning the visitor parking area and information kiosk.



Day of Caring Volunteers

5. Funding

As noted in last year's narrative, Congress failed to pass a budget in 2002. The near-perpetual continuing resolutions and evident confusion in distributing Department and Service funds resulted in a delay until May 28, the day we received our budget, the "Bluebook." The August date to commit all funds was earlier than ever.

In 2003, refuge funding was as follows:

1261	Operations	\$545.7 K
1262	Maintenance	\$120.6 K
9263	Fire	\$ 64.9 K
9264	Wildland Urban Interface	\$124.9 K

A personnel resignation (Outdoor Recreation Planner), additions (LMRD Biologist, Office Administrative Assistant), and promotions (Wildlife Biologist) resulted in decreases and increases throughout the year. Prescribed fire funds (9263) paid for seasonal permanent forestry technicians. Although not as severe as the landmark 2002 fire season, project fire assignments diverted the forestry technicians twice during the summer and resulted in salary savings for the station. Additional savings were accrued when the Office Assistant and a biological technician helped out with the Buzzards Bay oil spill.

Rachel Carson and Parker River NWR's were successful in competing for Challenge Cost Share funding through the Gulf of Maine Rivers Ecosystem team, the RHC share was \$8,800. The refuge competed successfully for challenge cost share grants for wetland restoration, one for \$29,636 and a tidal restoration grant of \$37,714. The tidal restoration grant transferred to Wells

National Research Reserve with the establishment of a Cooperative Agreement.

The increase in maintenance stemmed from YCC funding increase (\$22,350 in FY2003) a project to rehabilitate the Rust house (forced labor) \$20,000 in quarters funds, and the much needed replacement of our tractor \$51,526.

The North American program supported the Mt Agamenticus to the Sea conservation initiative by providing \$5,000 for administrative (coordinator's salary) costs which we passed along through a cooperative agreement with the fiscal arm of the organization, York Land Trust.

Wildland Urban Interface funds are largely pass-through dollars for The Nature Conservancy's interface efforts around the Massabesic Forest (\$90,890), but the refuge was able to spend about a fourth of the total on reducing Phragmites at critical areas along our boundaries.

The biological RONS project administered by the regional biologist again provided the where-withal to fund our standardized surveys. We received \$7360 for grassland breeding bird, marsh & waterbird, sparrow and anuran surveys. Environmental compliance funds provided \$6,600 to replace all the heating fuel storage tanks on the refuge (Headquarters, Residence 1, Houston house) and provide secondary containment around the tanks.

The Service did not recommend Land and Water Conservation funding for Rachel Carson NWR for the FY02 budget. Never-the-less, due to efforts by Friends of Rachel Carson, The Trust for Public Land and our other supporters, the refuge received \$1,500,000 to protect habitat.

Table E1. Funding history at Rachel Carson NWR

FUNDING HISTORY

2003	550,224
2002	487,300
2000	524,600
1999	368,900
1998	415,800
1997	316,100
1996	330,990
1995	106,250*
1994	N/A
1993	N/A
1992	126,930
1991	125,000
1990	171,000
1989	139,122

1988	123,117
1987	142,496
1986	69,735

*salary only

6. Safety

The annual fire fighter refresher training was held on April 1st. Refuge staff successfully completed the refresher training including the pack test.

YCC, interns, seasonal staff and half of the permanent staff attended basic first aid training at the end of June.

Several accidents and injuries occurred during the year. Very minor damage to the YCC vehicle occurred when backing in between trees at the HQ. The tractor received some damage from branches when mowing in September.

David injured his arm lifting a tool box, Sue A. fell in the marsh and injured her back, and Susan B. injured her hip doing vernal pool surveys. No injuries resulted in lost time during the year.

7. Technical Assistance

Refuge staff met with York County NRCS staff 2-3 times during the year to provide assistance in looking at and evaluating biological values of local grasslands for inclusion in the CRP, WHIP and other programs under the USDA.

8. Other

The refuge hosted the Maine competition of the Federal Junior Duck Stamp contest this year. The refuge assumed the responsibility from Aroostook NWR and will host the event for the next few years, or longer.

F. HABITAT MANAGEMENT

1. General

Habitats found on Rachel Carson NWR are quite diverse. Coastal salt marsh is at its northern limits in southern Maine. Rachel Carson NWR and the Scarborough Marsh State Wildlife Management Area encompass approximately 85% of all salt marsh habitat in the state. The rocky coast typical of Maine is also present and interspersed with sandy shores and barrier beach islands. Forested uplands consist primarily of young stands of mixed hardwood and softwood species. Grasslands, pitch pine back dunes, freshwater wetlands, tidal creeks, and shrublands comprise the remainder of the habitats. The State of Maine has designated focus areas of statewide significance. Wells saltmarshes, Brave Boat Harbor and sections of

Kennebunkport/Biddeford are included in these focus areas.

Rachel Carson and Parker River joined together to compete for a place in the new Land Management Research and Demonstration site program. This nationwide effort, based on the Fulfilling the Promise document, establishes a demonstration area program within the National Wildlife Refuge System for testing, teaching, publishing, and demonstration of state-of-the-art management. The Rachel Carson and Parker River LMRD sites focus on salt marsh management and restoration.

The LMRD program has the following 5 goals.

1. Demonstrate land management techniques designed to provide healthy habitats for fish, wildlife and plants.
2. Research, test and develop land management techniques.
3. Communicate information on featured habitats and associated management techniques to appropriate audiences.
4. Integrate career/staff development opportunities into Land Management Research and Demonstration program.
5. Evaluate and maintain Land Management Research and Demonstration program.

Some 230 refuges were included in the request for proposals. The proposals were reviewed by a federal and non-government panel of experts, and Rachel Carson and Parker River were ranked first in the Nation. In 2003 we hired Dr. Susan Adamowicz as the coastal saltmarsh LMRD biologist.

A project to map and quantify the extent and composition of invasive plants on the refuge was continued in 2003. This project was supported with funding from RRB Taylor. Contractor Deborah Kendall, contractor Kate Ostergren and intern Lindsay Wagner collected the field data. Contractor Kate Ostergren completed the GIS work with the assistance of Rick Schaffler. A few small parcels in Lower Wells and Upper Wells, easements in the Mousam River Division, and Biddeford Pool, Goose Rocks, Spurwink River Divisions remain to be mapped. GIS work has been completed for all areas mapped to date. If funding is continued, this project will be completed in 2004.

2. Wetlands

Tidal salt marsh constitutes the majority of wetlands occurring on RHC. Applications were submitted for three restoration projects in 2001: Biddeford Pool, Mousam River (1, 2 and 3) and the Little River. The U.S. Army Corps of Engineers required that the Mousam River and Little River projects have public review. These permits were still pending at the end of this year. pending.

We continued to collect data at Moody Point and Granite Point to support the USGS study focused on the impact of ditch plugging on salt marsh hydrology, vegetation and wildlife use (see research section).

We continued our community based purple loosestrife biological control program with assistance from a National Fish and Wildlife Foundation grant. We hired a Deborah Kendall as a coordinator for the project and hosted a beetle rearing open house and a workshop at the Wells Reserve. She established some baseline information regarding release sites and oversaw rearing operations. Deborah left in June to take a position with the York County Soil and Water Conservation District and we contracted with Kate Ostergren to assist with the workshop.



Staff discuss bio-control at the beetle open house.

We ordered 2000 adult *galerucella* beetles from the New Jersey Department of Agriculture and reared them on over 100 plants. Beetle production was not as successful as it had been in past years, we think due to a change in fertilizer for the plants. Beetles were released by the Saco Conservation Commission, Kennebunk Conservation Commission, Beach Plum Farm, Great Works Land Trust, Kennebunk Conservation Trust, Cape Elizabeth Conservation Commission, Kittery Land Trust and York Conservation Commission. Beetles were raised on site at Beach Plum Farm and in Saco.

Galerucella beetles at the Wells and Spurwink release sites continue to overwinter and feed on purple loosestrife. Plants at the Spurwink release site have been decimated, but still persist adjacent to that area. The Wells site shows significant damage, yet plants still present.

3. Forests

Forested uplands comprise approximately 25 percent of the total acreage of the refuge at this time. The forested areas are primarily of the oak-hemlock-white pine community typical of

southwest, coastal Maine. Small pockets of pitch pine forest also occur on the refuge.

The invasive species, glossy buckthorn, was hand pulled from two areas on the refuge. Staff worked to hand pull many trees just outside of our headquarters. The Youth Conservation Corps pulled many trees out of the Brave Boat Harbor Division. Complete removal was not achieved and there remains much work to be done.

5. Grasslands

Approximately 65 acres of grasslands were mowed this year.

A vegetation monitoring protocol was adopted using the guidelines provided in the USGS Grasslands Study. WB O'Brien created maps and selected random vegetation sampling points. Forestry technicians Kerr and Stanley, with minimal assistance of the WB completed pre-burn monitoring plots at the following burn units: Young, Libby, Kelly, Skillings, Dean Tito, Taylor, Cutts 1, Hosmer, Moody and Littlefield.

GIS polygons were drawn for the majority of field units.

6. Other Habitats

Rachel Carson National Wildlife Refuge has three beaches that support piping plovers, one of which also supports least terns. The piping plover is a federally threatened species and both the piping plover and least tern are listed as endangered under the Maine Endangered Species Act.

In 1998, Crescent Surf Beach underwent drastic alterations with most of the southern portion of the beach bisected and all vegetation washed away. By the spring of 1999, conditions along the southern half of the beach improved and provided good plover and tern nesting habitat. Conditions for plover and tern nesting continued to improve in 2000, with expanses of moderately vegetated, sandy areas increasing. In 2001, staff noted an increase in vegetation along the spit and a decrease in sand around the far arm. In 2003, a January winter storm washed over the beach (see photo). Dune grass was suppressed and the habitat in the spring looked great. The spit increased in length and width. Sedimentation at the mouth of the Little River has made access to Crescent Surf easier and people were documented wading across from Laudholm to Crescent Surf on several occasions.

In 2002, the refuge began to identify shrublands amenable for management for New England Cottontail and other shrub land species. In 2003 we designated several small units for shrub management for PIF priority birds and New England Cottontail.

9. Fire Management

The year started with the return of Mark Kerr on January 27 and Robin Stanley on March 17 as career seasonal GS-6 and GS-4 fire technician. Both attended several training sessions during the year: Robin Stanley- S-215, S-234, S-131, S-390, Refresher; Mark Kerr-S-215, S-234, Refresher, Completed Task Book for RXB-3.

Both Mark and Robin were sent on details for Wildland Fire Support during the year. Robin Stanley was dispatched to the Columbia NWR on a severity detail from 08/03/03 to 08/18/03. Mark Kerr was dispatched to the Robert Fire in western Montana and served in the capacity of a level 2 security officer from 08/08/03 to 08/24/03. Mark Kerr and Robin Stanley were both dispatched to the Crazy Horse Fire in western Montana. Kerr acted in the capacity of squad boss and sawyer, Stanley acted as squad boss trainee, from 8/26/03-09/09/03.

When not in training or on details, the fire crew conducted operations on the refuge both prescribed fire and mechanical treatments. We attempted to burn numerous times but were out of prescription. We also had to shut down several burns due to excessive smoke or when fires were not meeting resource objectives due to minimal fire behavior and green fuels. The Refuge also had a self imposed closed window for burning from 7/15 to 8/30 to allow for the nesting of ground birds.

Rachel Carson Units Burned

4/25/03	R-2A Houston	2	Acres
4/29/03	R-2B Houston	2	Acres
9/25/03	R-5A Dwight Field	.5	Acres
10/08/03	R-11 Libby West	10	Acres

The Refuge has a cooperative agreement with the Nature Conservancy to assist each other in both wildland and prescribed fire within the area. This year there was 100% reciprocity for the burns that were conducted. Refuge staff assisted at all TNC burns and Conservancy staff were present at all Refuge burns.

4/14/03	Martha's Vineyard	55	Acres
9/11/03	Kennebunk Plains Unit 15	50	Acres
9/12/03	Kennebunk Plains Unit 18	55	Acres
9/13/03	Kennebunk Plains Unit 2&3	25	Acres

In addition to TNC, the refuge crew also assisted on the following burns at other NWRs:

Moosehorn National Wildlife Refuge - 5/17/03 Blue Berry Plains, 10 Acres

Sunkhaze National Wildlife Refuge - 5/20/03 Red Pine Forest, 8 Acres

Petit Manan National Wildlife Refuge - 5/9/03 Petit Manan Island, 10 Acres



Prescribed Burning at Rachel Carson NWR

12. Wilderness and Special Areas

The two ecological reserves on the Refuge in the Braveboat Harbor and Upper Wells Divisions, enjoyed additional scrutiny this year from the Maine Natural Heritage program. A botanical survey was conducted to confirm historical records of rare plants. The Upper Wells reserve was designated for saltmarsh and creeks surrounding the lower Little River, Crescent beach and the wet pitch pine boarding the northern edge of the salt marsh. The Braveboat Harbor division site is considered an excellent example of zonation in saltmarsh areas south of the harbor on Cutts Island and north of the harbor at Raynes Neck.

The Refuge was selected along with Parker River NWR and designated as one of the first Land Management and Research Demonstration (LMRD) refuges in the country. The focus is on salt marsh ecology and a biologist was hired in August to conduct work at both refuges under this program.

G. WILDLIFE

1. Wildlife Diversity

A wide variety of species use the refuge due to the diversity of habitats both on and adjacent to the refuge. Some 250 species of birds have been recorded and many mammal and reptile species are also present, some at the limits of their ranges. Interesting sightings in 2003 include: roseate terns staging and loafing at Crescent Surf Beach in July, a rare white-winged tern (seen on Laudholm Beach), and a king eider at Wells Harbor. An American oystercatcher was seen at

Biddeford Pool on July 17th. Another interesting sighting includes a least tern which had most likely been color banded in Massachusetts.

2. Endangered and or Threatened Species

The Maine Endangered Species Act's species listing is subject to review every five years. This list was enacted in 1997. Due to staffing constraints at Maine Inland Fisheries and Wildlife a revision in 2003 did not happen.

Below is a current listing of Maine's endangered and threatened mammal and bird species that occur, or may occur, on the refuge:

<u>Species</u>	<u>Status</u>
Golden Eagle - <u>Aquila chrysaetos</u>	Endangered
Peregrine Falcon - <u>Falco peregrinus</u>	Endangered
Piping Plover - <u>Charadrius melodius</u> **	Endangered
Roseate Tern - <u>Sterna dougallii</u> *	Endangered
Least Tern - <u>Sterna antillarum</u>	Endangered
Black Tern - <u>Chlidonias niger</u>	Endangered
Sedge Wren - <u>Cistothorus platensis</u>	Endangered
Grasshopper Sparrow - <u>Ammodramus savannarum</u>	Endangered
Bald Eagle - <u>Haliaeetus leucocephalus</u> **	Threatened
Harlequin Duck - <u>Histrionicus histrionicus</u>	Threatened
Arctic Tern - <u>Sterna paradisaea</u>	Threatened
Upland Sandpiper - <u>Bartramia longicauda</u>	Threatened
Box Turtle - <u>Terrapene carolina</u>	Endangered
Black Racer - <u>Clouber constrictor</u>	Endangered
Blanding's Turtle - <u>Emydoidea blandingii</u>	Endangered
Spotted Turtle - <u>Clemmys guttata</u>	Threatened

* Federally listed Endangered Species

** Federally listed Threatened Species

Several mussels, mayflies, dragonflies, butterflies and moths are listed under Maine's Endangered Species Act. It is unknown if any of these occur on the refuge.

Maine Inland Fisheries and Wildlife maintains a list of special concern species. This list is administrative and has no legal standing. Several of these species occur on refuge lands, New England cottontail being one of them. In 2000, a coalition of groups petitioned the federal government for the species to be listed under the Endangered Species Act. In 2004, USFWS will determine if this species warrants federal listing. Refuge staff continues to document New England cottontail sightings and continues to pursue funding for NEC projects.

Piping Plovers

Since 2000 the refuge has taken primary responsibility for monitoring several sites on and off refuge lands. The refuge monitored Crescent Surf, Laudholm, Parson's, Marshall Point,

Goosefare Brook, and Ferry Beach. A total of 19 nesting pairs, with 26 nesting attempts and 8 successful nests, produced 27 chicks with a total of 20 fledglings. Nest success was particularly low at Crescent Surf Beach due to crow predation. Lucy Burnell was our plover technician for 2003.

An all time high of eight plover pairs, initiated a minimum of 12 nests at Crescent Surf in 2003. A total of 37 eggs were laid, of which none hatched. Crow nest predation on an unexclosed nest was documented in 2002. In 2003, all nests, exclosed and unexclosed, plovers and terns, were predated by crows on June 6th, 7th and 8th. Twine tops on plover exclosures had been used as visual deterrent for many years, however in 2003; the crows learned how to enter those exclosures. We contacted Anne Hecht at USFWS-ES for advice. She suggested we abandon the use of exclosures on Crescent Surf until we could control the crow problem. She felt we risked adult mortality if the crows continued their harassment of the plovers using exclosures. We began an aggressive crow eradication program and shot crows that had keyed in on the beach (see plover report 2003). We installed a scarecrow at the tip of the beach. Eventually crow egg predation ceased, however it was too late in the season for plovers to renest. One pair did move to Parson's and successfully renested.



We'll try anything to stop plover predation.

Piping plovers were not found nesting at Marshall Point; however, plovers nested across the river at Goose Rocks. Early in March a pregnant female fox was trapped and removed from the beach. Although there was not an active den on the beach, the fox population around Marshall Point is very high and fox tracks were seen frequently on the beach.

One piping plover pair nested at Goosefare Brook in 2003. A larger area was fenced off and posted for the protection of the plovers. Symbolic fencing was continued from the beach back

towards the cove where the chicks were feeding. We had one vandalism incident where a large branch was tossed onto the enclosure. The branch caught on the orange twine and was dangling several inches over the nest. However, the branch was removed and the plover continued incubation. One pair produced four eggs, four of which hatched, all chicks reached maturity and fledged. Pedestrian and unleashed dog trespass in the nesting area remains a problem at this site.

On off-refuge lands, the refuge took primary responsibility for pairs nesting at Laudholm Beach. Seven pairs initiated nine nests and produced ten fledglings at Laudholm Beach in 2003. A total of 35 eggs were laid, of which 14 hatched. Laudholm Beach was also plagued by predation on plover nests by crows. Since the majority of the crow activity was at Crescent Surf, we did change the tops of the remaining nests from twine to blueberry netting. Crows did not appear to harass those nests and Laudholm had a productivity of 1.43. Increased effort by Maine Game Wardens and signage did appear to help reduce the number of dogs on the beach. However, dog use remained a chronic problem. It is likely that a dog ate two plover chicks at Laudholm, however it was difficult to prove. Other issues included a dead seal which had been shot, children chasing plovers with sticks and 30 pieces of driftwood being placed within the symbolic fencing.

The refuge worked with private landowners on Parson's Beach to protect the 4 pairs (1 was a re-nest) which nested there. Landowners with plover habitat were contacted early in the year to request permission to manage plovers on their lands. All beach front landowners, except two, granted permission. Symbolic fencing was erected early on the Alling's property in an attempt to make it more hospitable to the plovers. One pair nested near their path, another on their other beach lot, one nested on Mr. McMaster's land and another pair nested at the northern tip of Parson's Beach on Dwight property. The nest on Mr. Dwight's land was abandoned after enclosure. We suspect the other adult in the pair died, as we only saw one plover in attendance for weeks. The pair on Mr. McMaster's property could not be enclosed because we could not get landowner permission. A total of fourteen eggs were laid, of which nine hatched and six fledged.

The refuge also had primary responsibility for weekly searches for piping plover activity at Ferry Beach. Plover tracks were found during the International Census, however, no nesting activity was documented in 2003.

In 2003, Maine had an estimated 61 pair of nesting plovers which produced 78 fledglings. This year refuge lands supported 15 percent of plover pairs in Maine, but were responsible for only 5 percent of fledglings. Productivity on refuge lands dramatically declined due to crow predation. However, when off refuge lands that were managed by USFWS are considered, we produced 20 fledglings, about 25 percent of all of the fledglings produced in Maine. In previous years refuge lands supported 10 percent of the nesting plover pairs in Maine and when off Refuge lands were factored in refuge management produced 33 percent of all the fledglings in Maine.

Year	# of Pairs	# Pairs Nested	# of Nests	# of Chicks	# Fledged
2003	8	8	>12	0	0
2002	5	5	5	9	6
2001	5	5	5	15	14
2000	3	3	2	7	7
1999	4	4	4	10	4
1998	3	3	5	14	6
1997	4	4	4	18	13
1996	5	5	5	18	15
1995	4	4	8	10	9
1994	4	4	4	15	11

Nesting success of piping plovers at Crescent Surf Beach for the last 10 years

Refuge staff surveyed Laudholm, Crescent Surf, Parson's, Marshall Point, Goosefare Brook and Ferry Beach during the International Piping Plover Census in June.

Least Terns

University of Maine graduate student Jordan Perkins continued her thesis work to document limiting factors for least terns in Maine. She banded 57 chicks at Crescent Surf Beach. She counted nests, chicks and fledglings. She compared two methods for estimating number of pairs, high nest counts and also counting incubating terns and adding in nests that had already hatched. The later method gave a higher estimate.

Least terns are listed as an endangered species by the State of Maine and as a PIF priority species for Area 9. In June, Crescent Surf was well on its way to hosting the largest nesting colony of least terns in Maine. However, massive crow predation on nests caused the colony to split and relocate to other local beaches. Crescent Surf had a total of 168 documented nests of which 18 percent hatched and 8 chicks fledged. Early season crow predation and late season owl and coyote predation depressed productivity. For the 2004 field season we will again control crows and also use an electric net fence to keep mammalian predators out.

WB O'Brien started a least tern list serve to address management issues. To date over twenty people have signed up. WB O'Brien is working with Anne Hecht (ES), Sara Williams and Stephanie Koch (Refuges) and Ruth Boettcher (State of Virginia) to collate productivity and pairs for the east coast population of least terns. Once the information is gathered it will be sent back out to the field.

Least Tern Pairs and Productivity

Beach	Estimated Pairs	Est. Fledglings
Laudholm	20	0
C. Surf	57	8
G. Rocks	8	0
Higgins	38	53
Reid State	33	5
Total	156	66

YEAR	PIPING PLOVER			LEAST TERN		
	Crescent Surf	Laudholm	Statewide	Crescent Surf	Laudholm	Statewide
2003	8(0)	7(10)	61(78)	57(8)	20(0)	156(66)
2002	5(6)	5(15)	65(88)	106(134)	12(10)	157(153)
2001	5(14)	4(14)	55(109)	102(50)	15(7)	120(63)
2000	3(7)	6(14)	50(80)	85(62)*	37(17)*	126(81)*
1999	4(4)	4(11)	56(91)	40(45)	20(20)	62(67)
1998	3(6)	2(3)	60(88)	22(7)	0(0)	86(12)
1997	4(12)	1(2)	47(93)	18(1)	0(0)	50(11)
1996	5(14)	1(4)	60 (98)	16(0)	0(0)	60(30)
1995	4(9)	1(2)	40(95)	25(9)	8(0)	100(16)
1994	4(11)	1(3)	35(70)	35(32)	12(13)	89(79)
1993	4(16)	1(4)	32(76)	64(62)	1(3)	125(114)
1992	4(16)	1(0)	24(49)	15(42)	14(11)	94(123)
1991	3(9)	1(3)	18(45)	0	1(1)	52(25)

Number of nesting pairs and fledglings () of piping plovers and least terns at Crescent Surf Beach, Laudholm Beach and statewide for the last thirteen years. Estimates for 2002/2003 are preliminary results from U. Maine graduate student Jordan Perkins.

** Approximate number of fledglings; numbers adjusted from 2000 Maine Audubon Final Report*

In late July a meeting to address crow predation was held at Rachel Carson NWR. Anne Hecht, Wildlife Services, Parker River NWR, Maine Audubon, NHF&G, and Trustees of Reservations were in attendance. The meeting focused on how to address avian predation issues on least tern and piping plovers. The pros and cons of lethal and non-lethal approaches were discussed. After some deliberation the staff at Rachel Carson NWR will continue with direct removal measures and the use of blueberry netting for exclosure tops. If that proves unsuccessful, we will consider the use of a chemical deterrent.

Other

We recorded more than the usual number of roseate terns at Crescent Surf this year, most likely due to the break-up of the colony on Stratton Island. Of particular interest was the appearance of a banded Roseate Tern on Crescent Surf Beach. It was banded with field readable leg bands. The band number was recorded and that bird had fledged off of Stratton Island in 1999.

Bald eagles are seen every winter in the Biddeford/Saco area feeding along the Saco River. Bald eagles were also seen on the York and Mousam Rivers.

3. Waterfowl

The refuge provides habitat for breeding, migrating and wintering waterfowl. Breeding populations are small and include Canada geese, black duck, mallard, wood duck, teal and common eider. Common eider broods can be regularly observed in summer on Biddeford Pool, Goose Rocks and Goosefare Brook Divisions. Small populations of migratory waterfowl include pintail, American widgeon and ring-necked ducks. Offshore, migratory species include three species of scoters, common eiders, red-breasted mergansers, and long-tailed ducks. The majority of the use during the year is from wintering waterfowl. Black ducks are the most common wintering species and, with open water, can be found on every marsh and river. Groups of common eider, common goldeneye, bufflehead, common loons, long-tailed duck, and red-breasted merganser can be found in river mouths and in the waterways of salt marshes.

No aerial surveys were conducted due to budget shortfalls at Rachel Carson and Parker River.

On January 7, the USFWS conducted the midwinter inventory. The refuge lies within Unit 8.

Species Total	Mallard	Black	Common Goldeneye	Bufflehead	Long-tailed Duck	All Scoters	Common Eiders	Mer-gansers	Canada Geese
2003	514	1974	174	241	148	959	2908	104	392
2002	880	2665	221	224	341	116	6626	958	529
2001	419	710	71	103	224	510	4477	126	567
2000	221	1014	117	77	301	850	5129	434	402

Selected Species survey summary for Unit 8.

Common eiders, black ducks, mallards and mergansers were the most numerous species present.

Also, of note were eighteen loons and zero mute swans. Total ducks observed was 7,632, sharply down from 2002's 12,668 observed. However numbers are up from 7,267 in 2001 and 11,199 in 1999. Midwinter waterfowl counts vary greatly depending on weather and ice conditions. Numbers are useful for interpretation over long time intervals.

4. Marsh and Water Birds

Eleven species are documented to occur on the refuge. Great blue heron, Virginia rail, snowy egret, great egret and green-backed herons account for the majority of use by this group. Less commonly observed species include little blue heron, American bittern, tricolored heron, black-crowned night heron, and glossy ibis. The refuge provides essential staging and feeding areas for these species. During the spring, summer and fall, these birds spend time feeding in the extensive creeks and salt pannes.

Nancy Williams returned to the refuge for a third year to conduct marsh and wading bird surveys following a standardized survey protocol. Seven routes were conducted throughout the refuge with a total of 51 points. All points were surveyed three times and consisted of playing a tape to elicit a response by the target species. The tape used was the interior habitat callback tape that had recordings of the following species: least bittern, sora, Virginia rail, yellow rail, common moorhen and pied-billed grebe.

The only primary species observed during the survey periods was the Virginia rail, found at three locations. Rails were counted repeatedly at point gomw04 in Cape Porpoise and off of Elderedge Road. Rails were not detected at Marshall Point this year, but they were detected for the first time at the Hosmer access in Brave Boat Harbor. The most common secondary species recorded were red winged black birds and common yellowthroats. Some of the non-target species observed during the survey period included kingfishers, green-backed herons, snowy egrets, willow flycatchers, swamp sparrows and great blue herons.

5. Shorebirds, Gulls, Terns and Allied Species

The refuge is used at various times of the year by up to 35 species of birds in this category. Greater and lesser yellowlegs, black-bellied plover, semipalmated plover, dowitchers, willets, and least and semipalmated sandpipers are the most commonly observed shorebird species found on Rachel Carson NWR. Along with the common species, a great diversity of other shorebird species are recorded using the refuge including: whimbrels, black-bellied plovers, American avocet, dowitchers, American oystercatchers and sanderlings.

Refuge salt marshes, mudflats and salt pannes provide habitat for nesting, feeding and staging for these species. Purple sandpipers, sanderlings and dunlins winter along the Maine coast and can occasionally be found on the refuge during that time. Key areas of high shorebird use on the refuge include the Webhannet River mud flats adjacent to Oxcart Lane and Wells Harbor, the Little River mudflats on the Upper Wells Division, Crescent Surf Beach, and Sampson's Cove on the Goose Rocks Division.

Fourteen shorebird surveys were conducted during the year and the data entered into the refuge

CENSUS database program. Shorebirds populations generally peak around late July/early August, during fall migration. The refuge is also a stopover for shorebirds during spring migration. Some species, such as willet and killdeer are known to breed in salt marshes at Granite Point and in the Webhannet. A successful willet nest was confirmed at Granite Point marsh when WB O'Brien observed chicks

Intern Lindsay Wagner created a draft shorebird survey protocol which would be compatible with PRISM shorebird surveys. She analyzed our previous shorebird data and identified areas that on average support > 75 percent of the total shorebird sightings on the Refuge. These sites were identified as Type 1 survey sites and consisted of Ox Cart Lane in Wells, Sampson Cove in Cape Porpoise, Mile Road in Wells, Wells Harbor and Ocean Ave in Moody. She identified these areas as priority shorebird survey areas and mapped those using GIS. She also identified areas which should still be surveyed (Type 2), but not as intensively as our major shorebird concentration areas. We also considered surveying Crescent Surf Beach, as that is a major shorebird roost area.

Gull species present throughout the year are primarily greater black-backed and herring gulls. Other species seen at various times of the year include ring-billed gull and Bonaparte's gull.

Common terns can be found throughout most of the refuge's divisions. Common terns stage for post breeding migration in great numbers (200+) at Crescent Surf Beach.

Staff did not conduct woodcock surveys on the Refuge in 2003. WB O'Brien did conduct the North American Woodcock Singing Ground Survey in Lebanon, Maine.

6. Raptors

Four species of raptors have been confirmed as breeding on the refuge: osprey, sharp-shinned hawk, Cooper's hawk and great horned owl. Northern goshawk, red-shouldered hawk, red-tailed hawk, broad-winged hawks, American kestrels, and barred owls are probable breeders. Other species present at various times include northern harriers, merlins, short-eared owls, northern saw-whet owls and snowy owls. Osprey nested on the Lower Wells Division for the first time in since the 1980s. Volunteer Doris Adams monitored the nest and one chick fledged successfully and left the area in early September.

7. Other Migratory Birds

The refuge initiated grassland bird surveys using a standardized survey protocol in 1999 and continued the surveys in 2003. Forty-four points were established along six routes throughout the refuge and run twice between May and July. Survey routes were conducted at York River, Goosefare Brook, Goose Rocks, Spurwink River, Brave Boat Harbor, Upper Wells, and Moody Divisions. Bobolinks were common at many divisions with the exception of Brave Boat Harbor, Lower Wells, Mousam River, Biddeford Pool and Goosefare Brook. Eastern meadowlark and savannah sparrows were also documented using the refuge.

Breeding landbird routes on the Goosefare Brook and Spurwink River Divisions were continued

for the third consecutive year. In 2003, these routes were surveyed once by contract biologist George Gavutis. Relative abundances (total of individuals of a species/total of individuals of all species detected) are included in parentheses. At Goosefare Brook a total of 43 species and 319 individual birds were recorded. The most abundant species detected were ovenbird (12.23), black-capped chickadee (10.34), American crow (10.34), black-throated green warbler (9.09), American goldfinch (5.96) and red-eyed vireo (5.33). At Spurwink River a total of thirty-three species and 154 individual birds were recorded. The most abundant species detected were blue jay (8.44), American crow (7.79), common yellowthroat (7.14), cedar waxwing (6.49), black capped chickadee (5.84) and rose-breasted grosbeak (5.84). Species diversity and the total number of birds observed per route decreased from 2002 to 2003.

WB O'Brien analyzed the five years of landbird surveys at Brave Boat and Upper Wells, and the four years of breeding bird data at Goosefare and Spurwink (see Rachel Carson National Wildlife Refuge Breeding Landbird Analysis Brave Boat Harbor, Upper Wells, Goosefare Brook and Spurwink River Divisions, 2003). She identified high priority Partners in Flight (PIF) species detected during the survey, indicated which were common on the refuge, and included population trends from the USGS Breeding Bird Survey.

The refuge surveys for salt marsh sparrows at over 100 points. The survey was run for the fourth consecutive year in 2003. See below for frequency (points observed/total number of point*replicates) by Division. Frequencies were slightly lower in 2003 than they were in 2002, mostly due to declines at the York River, Upper Wells and Biddeford Pool. Statistically relevant long term trend analysis for the sharptail sparrows should be complete within the next two years.

Division	Frequency Saltmarsh	Frequency Nelson's	Frequency Unk. STSP	Ave. 2002 Frequency	Ave. 2003 Frequency
BBH	.06	.03	.03	.03	.04
York River	.23	.36	.20	.43	.26
Moody	.39	.59	.41	.44	.46
Lower Wells	.45	.46	.36	.43	.42
Upper Wells	.46	.73	.46	.66	.55
Mousam	.20	.06	0	.02	.09
Goose Rocks	.24	.18	.15	.18	.19
Little River	.66	.53	.33	.60	.51
Biddeford Pool	.14	.33	.14	.32	.20
Goosefare	.66	.83	.42	.66	.64
Spurwink	.44	.51	.33	.43	.43
Average	0.36	.41	.26	.38	.34

The refuge maintains 33 nest boxes for eastern bluebirds. Boxes 13 and 15 have been removed due to house sparrow use. Tree swallows accounted for more than 50% of box use. A great crested flycatcher nested in a box outside of our headquarters. Boxes were checked every few weeks during the summer by staff, volunteers and interns. Data for table below is incomplete due to infrequent monitoring and the untimely death of refuge volunteer, Karen Harder.

Species	Tree Swallow	Black-Capped Chickadee	House Sparrow	Eastern Bluebird	No Use
# Boxes Used	10	2	0	4	5

Summary of nest box use for 2003, some boxes were used multiple times, not all boxes included in analysis.

8. Game Mammals

White-tailed deer are common throughout the refuge. The Upper Wells Division contains the largest concentrations due to a state-designated wildlife sanctuary that overlays the area and generally precludes hunting. A special season was opened by permit only in 2002 and held again in 2003. Moose are being sighted more frequently on the refuge and can be seen on most of the divisions, particularly Upper Wells and Mousam River.



Moose can be found on almost every division of the refuge.

9. Marine Mammals

Several harbor seal haul-outs exist at the Brave Boat Harbor, Lower Wells, Mousam River and Goose Rocks Divisions. The most frequently used site is the marsh near the Wells Harbor on the

Lower Wells Division. As many as 25 seals can be observed here at various times of the year. In the winter season, harp, gray and harbor seals can occasionally be seen hauled out in refuge salt marshes. In 2003, a dead seal was found on Laudholm Beach and it had been shot. Later in the year several skinned seal carcasses washing up on beaches from Wells to Cape Cod were reported. Special agents believe poachers have been killing the seals and selling parts. Reward money for information leading to prosecution of the poachers has been posted by NMFS.

An unusual beaked whale was found dead at Parson's Beach. This species generally occurs in deep seas, far offshore. The discovery of the carcass in Maine was quite unusual. Scientists from Woods Hole investigated.

10. Other Resident Wildlife

More than 47 species of mammals (including marine mammals) can or have been reported on the refuge including beaver, river otter, ermine, flying squirrel, porcupine, and fisher. For some species such as the pine vole, the only state records are from the refuge.

Refuge staff did not conduct anuran call count surveys in 2003. It was determined that previous years data provided a general baseline and further data collection would not contribute to national monitoring efforts. USGS sponsored research continues to document the relationship between vernal pools and habitat, and has documented both wood frog and spotted salamander breeding in many areas on the Refuge.

11. Fisheries Resources

The refuge provides for numerous fin and shellfish species. Some of the species using the refuge include alewife, American eel, blueback herring, rainbow smelt, bluefish, Atlantic menhaden, striped bass, and winter flounder.

The refuge is also part of essential habitat designated by the National Marine Fisheries Service for several important species.

14. Scientific Collection

Three inviable piping plover eggs were delivered to Biodiversity, Inc. and USFWS Ecological Services for mercury and total containment analysis. Additional least tern eggs were transferred to USFWS Ecological Services for contaminant analysis.

15. Animal Control

During the peak of least tern nesting on Crescent Surf Beach, several individual American crows keyed in and decimated the nesting colony as well as several piping plover nests. One individual would walk through the tern colony destroying eggs and was almost completely white washed. Staff immediately took action to remove and harass the crows with only limited success as they proved to very cagy birds.

16. Marking and Banding

Waterfowl banding was not conducted this year. As part of her research, Jordan Perkins placed temporary plastic bands on 57 least tern chicks.

17. Disease Prevention and Control

West Nile Virus continues to spread northward from New York into New England. In 2001 seven birds tested positive for West Nile Virus in Maine. In 2003, the State of Maine tested dead corvids for West Nile Virus. In York County 24 out of 40 birds tested were positive for WNV. In Cumberland County 39 out of 63 birds tested were positive. Refuge staff will continue to be on the alert for sick or dead birds. In 2001, the Maine Department of Human Services established a toll free number (1-888-697-5846) to report dead birds.

Lyme disease continues to be prevalent on refuge lands. Staff and volunteers continue to be provided with information on how to protect themselves against Lyme disease.

Chronic Wasting Disease (CWD) has yet to be reported in Maine. State officials continue to monitor wild and captive deer for this disease.

H. PUBLIC USE

1. General

Over 265,000 people visited the refuge this year to enjoy the trails, hunt deer and waterfowl, fish, learn about natural history and wildlife management, and appreciate the natural beauty of the area. Visitors come from almost all 50 states and Canadian Provinces every year and from countries throughout the world.

The YCC camp completed work on the two mile Cutts Island Trail on the Brave Boat Harbor division in Kittery. Use at this popular trail is estimated at approximately 10,000 annually.

The YCC camp also completed an observation platform overlooking the Mousam River in Kennebunk. The platform is located just off a town owned trail over an old trolley line and passes through the Mousam River Division. The trail receives well over 25,000 people each year and an estimated 15,000 will use the overlook.

Other trails are the Atlantic Way and Ted Wells trails in Saco and Old Orchard Beach respectively. Use of these two trails combined is estimated at 20-30,000 annually as both are very popular in more developed areas.

2. Outdoor Classrooms-Students

Field trips to the refuge by local school districts, day camps, scouting troops offered insights into marsh ecology, botany, geology and hydrology. Schools also come from Massachusetts and

New Hampshire.



Local students learn about migrating Monarchs every year.

The Environmental School in Ocean Park with a SUP teaches salt marsh ecology and other programs on portions of the Goosefare Brook division to approximately 1700 students each year

4. Interpretive Foot Trails

The Carson Trail, located at the Refuge HQ in Wells, is one mile, self-guided and wheel chair accessible.



The Carson Trail receives over 100,000 visitors annually

6. Interpretive Exhibits/Demonstrations

The refuge held its second Youth Fly Fishing event in partnership with the Kittery Trading Post. The event on June 16 was attended by 20 kids and their parents to receive an introduction by Kittery Trading Post fly fishing expert, Chris Henson. Despite the rain and having to move the demonstration into our shop/garage, everyone had an enjoyable time and learned something new. We received very favorable comments and a request to host such a program for adults as well.

7. Other Interpretive Programs

The refuge held many events in conjunction with the NWRS Centennial. The following is a list of events held:

- 3/14 The first event held was the filling of the time capsule with numerous items placed in the capsule. Local reporters, neighbors, partners, staff and volunteers were present for the event and enjoyed some birthday cake.
- 3/18 Region 5 Centennial Bus Tour started with a lobster dinner the night of arrival. The next day the tour went to formally dedicate a new observation platform in Saco with friends, neighbors, local dignitaries and representatives from Congressman Tom Allens office. A second stop at newly acquired land at the Biddeford Pool division started with the first blue goose boundary signs posted followed by discussions of the historical and cultural values of the property, and the biological values of the land and Biddeford Pool.
- 3/25 Second day stamp cancellation conducted by the Wells Post Office at the refuge headquarters with over 70 cancellations.
- 7/12 The refuge held a performance of "Sense of Wonder" by Kaiulani Lee in partnership with the Wells National Estuarine Research Reserve. The one woman show about Rachel Carson was held at the Kennebunk High School and attended by 85 people.
- 10/10 Several staff travel to the State House in Augusta to join with staff from Aroostook NWR, Moosehorn NWR, Petit Manan NWR as well as individuals from the Friends of Petit Manan NWR, Friends of Sunkhaze Meadows NWR, and Regional Office staff. At the state house Maine Governor Baldacci formally declared the week of October 12-18 as Maine National Wildlife Refuge Week recognizing the six staffed refuges in Maine. The Governor was presented a commemorative Pendleton Centennial blanket on behalf of the FWS.

The refuge also held the Maine Junior Duck Stamp competition after taking over the program from Aroostook NWR. Five judges carefully evaluated over 400 entries in the four categories and finally selected a pair of ring-necked ducks by 16 year old Sam Boss from Bangor as the Best of Show for Maine. In addition to having his entry forwarded to the national competition, where he received an Honorable Mention, Sam received a pair of binoculars courtesy of LL

Bean. Judges for this year's contest were: Bill Vail, State Office Representative for Senator Collins; Janith Taylor, US Fish and Wildlife Service Regional Wildlife Biologist; Ray Whittemore, Ducks Unlimited North Atlantic Conservation Programs Manager; Berri Kramer, Executive Director of the Heartwood College of Art; and Tim Spahr, District Game Warden.

8. Hunting

The refuge is open for the following hunting seasons as set by the State of Maine, archery and firearm deer seasons, waterfowl (sea ducks only when concurrent with regular duck), and pheasant. The refuge also allows falconry during the special season as set by the State which usually runs through the end of February.

The refuge hunting permit and fee are set based upon what species a hunter was interested in. For the first time since 1995, the number of hunters obtaining permits declined from 425 in 2001 to 403. One hundred eight (108) new hunters, 12 seniors with complimentary state licenses and 46 youth hunters obtained permits. Table H-1 shows the number of permits issued for each hunting category. Because a hunter could actually have a combination permit to hunt during different seasons i.e., deer and migratory bird, the actual number of permits/ category is greater than 425. Hunters spent an estimated 2,750 days hunting on the refuge.

2003-2004 Hunting Season - Number of Permits Issued Per Category				
Deer	Migratory Birds	Pheasant	Falconry	Total
309	136	36	5	486
64%	28%	7%	1%	100%

The state implemented a youth deer hunting day on October 25 this year and again held a youth waterfowl day on September 21.

For the second consecutive year, portions of refuge lands in the Upper Wells Division that fall within the State designated Wells and Drakes Island Game Sanctuaries were opened for a limited two week special archery hunt. IF&W estimate up to 100 deer per square mile in that area, well above the desired levels. Approximately 200 acres of the refuge were open to archery hunters with refuge hunting permits. Sixteen hunters notified the refuge of their interest in this special hunt and were issued special state permits for the two week season after complying with additional state requirements including not having any previous hunting or fishing violations. Participants could harvest three antlerless deer and keep one with the other deer donated to Hunters for the Hungry. Hunters could obtain another permit allowing three more deer if they wished. Hunter activity was light with only 12 deer harvested with none coming from the refuge area. It is expected that this special hunt will occur again in 2004.

9. Fishing

The refuge was officially opened to fishing in 2000. Eight areas have been designated for bank fishing and provide an estimated 300 anglers fly and bait fishing opportunities to pursue primarily striped bass and sea run brown trout.

In June the refuge again hosted a youth fly fishing class in partnership with the Kittery Trading Post. Twenty youths and parents attended the event which had to be held in the refuge shop due to heavy rains. This popular event will continue to be held and hopefully the weather will cooperate to allow some real fishing.

10. Wildlife Observation

The Goosefare Brook observation platform was completed during the year with the planting of vegetation to keep visitors from cutting through to the beach. A scope was installed on the platform to provide visitors the opportunity to see nesting piping plovers as well as other shorebirds and waterfowl using the area.

YCC constructed a new observation platform along the Mousam River just off the Bridle Path which is a town owned trail that runs through the Mousam River Division. The platform was built of recycled lumber and placed at a site which has received illegal camping activity, and severe bank erosion. YCC will build a boardwalk with railings from the trail to the platform in 2004.

17. Law Enforcement

Rachel Carson NWR encompasses over 5,000 acres in 10 divisions and in FmHA easements along 60 miles of the southern Maine coast. This area of Maine receives approximately 7 million visitors each year with most during the summer months. The combined permanent population for York and Cumberland Counties is approximately 500,000. Visitation occurs year round as people seek to enjoy the fall foliage, migration, and winter skiing and snow shoeing, as well as the summer activities.

The refuge experienced several thefts of the contents from our donation box at the Carson Trail. The thefts began in October and continued through the rest of the year. The perpetrators cut the padlock to remove the contents on four different occasions. The incidents were entirely random and would happen on different days of the week which made it nearly impossible to conduct surveillance. The incidents were reported to the local police department.

Other incidents during the year included motor vehicle trespass, vandalism, ATV and snowmobile trespass, abandoned boats, trespass, hunting and fishing violations, etc.

The forfeiture of collateral (FOC) schedule was revised and approved by the Federal courts in late July after a long and arduous process between the various refuges and the division of LE. The fines now are more appropriate and realistic for the violations that are occurring.

Refuge officers participated in two details during the year. In May, officer Taylor was detailed to Vieques to provide LE assistance after the transfer of ownership from the Navy to FWS.

In late July-early August, both officer Kerr and Taylor were detailed to Aroostook NWR in Limestone, Maine to provide LE assistance to the refuge during a three day concert by the group

Phish held on the former Loring AFB immediately adjacent to the refuge. Providing 24 hour coverage with overlapping shifts officers documented numerous trespass and several drug possession violations. Officers also provided assistance to other state and local agencies with drug incidents and traffic control. The event was attended by an estimated 100,000 people.

Officer Kerr was also completed a Watch office detail during November.

The refuge has two collateral duty officers, DRM Taylor and lead FT Kerr. Both officers successfully completed the semi-annual firearms training, and attended the R-5 in-service at NCTC in April. Officer Kerr also completed the AR-15 rifle training at NCTC in October.

I. EQUIPMENT AND FACILITIES

1. New Construction

The New Year began with the continuation of a project that began the year before. The Rust House Project was a major renovation project, which included new space. The old building was a single bedroom seasonal cottage with a loft and was converted to a four bedroom capable of sleeping 5 adults, two beds in the loft. The construction project involved the complete removal of the kitchen and bathroom and the relocation of the stairs to the loft. A new water supply will be run. The single bedroom will be divided in half and a new bedroom will be built on the old porch. The problem areas that were encountered all centered on a poor foundation and a dirt floor crawl space. Insect damage was somewhat extensive. The affected areas were rebuilt and the infested wood removed. Persistent pesticides were not used. Given the condition of the building, a technique in wall construction was used to minimize the effect of placing a wall in an area that would transfer the load to the floor. Where it was practical the floor was repaired. Where it was feasible, the walls were attached to the roof to transfer the load to the outside walls. The lack of good foundation enabled creative framing to solve the dilemma.

The installation of new door locks would not be generally thought of as new construction, however the installation of an access control system would be. The refuge purchased and installed Best Locks. The project was in response to the problem that faces any institution where keys are issued to locks on buildings without the proper control or mechanism. The Headquarters building, the office annex building, and the new shop building all had new locks installed. The system the refuge is using will allow the refuge to control access to either the specific building or even the specific door. Expansion capability is crucial to access control. The Best system will allow expansion to any type of locking device that uses a key.



The Rust House underwent some major renovations this year.

Another of the many new construction projects undertaken was the installation of a new phone line to allow communication with the remote weather station. The project evolved like many projects do. Initially it was considered to seek permission from an adjoining land owner to allow the Refuge to trench in front of their lot for a new phone line and a new electric service. The utilities were already buried in the subdivision and it was thought that it would coincide with the intent of the refuge. However, permission was not sought from the adjoining land owner because if a trench were placed where it was needed by the refuge; it would cut off the access of the undeveloped lot to the utility connection. The solution was to connect to the telephone service where the poles were adjoining the refuge boundary. The project involved having the Utility Company install a pole to carry the service and a trench to bring the connection to the weather station. The weather station operates on both solar and battery power. The addition of an electrical connection, although practical, was not feasible given the distance to the source; over 700 feet.

The YCC crew began construction on an overlook deck. The base material for the frame was pressure treated lumber because of the contact with the ground however the decking material was a wood plastic composite. It proved very easy to machine, and was less likely to cause an injury because it does not splinter and a dust mask is not required when you saw it.

2. Rehabilitation

The residence next to the Headquarters was rehabilitated after a long term resident moved out. The base condition of the house was fair. The lack of maintenance played a significant role in its condition. The interior of the building was the only area to be addressed. The entire interior was repainted. The choice of paint color was made to coincide with the color already in use in the headquarters building. This gave the refuge uniformity and ease of blending new renovations

in with the old without having to try and match different paint schemes. The bathroom was in need of repair. The wallpaper was peeling and the walls were covered with mold. The solution was to remove the old wallpaper. Wallpaper is a labor intensive endeavor and is always a concern in rental housing. The mold was addressed by combining the light switch and the ventilation fan switch. Every time the bathroom was being used the fan should have been on. This eliminated the mold. Mold was also present in the tops of the closets. Each closet had the shelving reduced to one shelf and it was recommended not to stack the things on that shelf too close to the ceiling. The floors in the residence were sanded. The oak flooring retained most of its wear layer even though it had been sanded once before. The attached garage to the residence was converted to an office space. It remains that way today.

The Field Headquarters was also completely painted and lots of drywall repair was done. The outside light that illuminated the parking area was wired into the residence service panel. It was moved to the panel that powered the field office. The Houston property also received a new paint job to the living room and the front bedroom.

3. Major Maintenance

Most of the projects in this category have been mentioned in the paragraphs above. The change over of the security light from the residence panel to the field office was completed to allow the resident to pay for their electricity use and not the use of the refuge.

The Houston property sustained a tub leak that needed a special repair. The fixtures in the property date from the early 1950's or 60's. The pipe used was galvanized supply lines and brass tubing. The old pipe had to be reused because it is no longer available and will not match up to the current dimension pipe used today. Like many projects on the refuge, timing is strategic when it comes to funding. The bathroom will need a makeover when the time is right.

The Grant Cabin needed to have its winter tenants evicted and the mess they leave behind cleaned up. There were also a few plumbing issues addressed. The Town of Wells, Fire Dept. agreed to inspect the chimneys for the refuge at the Houston property. There were no major surprises except that the person sent to inspect the chimneys inspected them on the ground and was not able to inspect them from the roof.

4. Equipment Utilization and Replacement

The Refuge was the recipient of several new pieces of equipment. The first one is undoubtedly the John Deere 6420. The new 6000 series tractors bring the latest in electronic engine controls and implement use. Several on board computers allow the operator to manage the implement use with the other tractor functions with greater ease. The tractor is a welcome addition to the refuge.

A 2003 Ford extended cab pick up was added to the fleet. It was ordered with an auxiliary fuel source. Propane was chosen over Natural Gas because of the availability of propane. Although propane is made from petroleum it is still cleaner burning and lacks some of the carcinogenic compounds found in gasoline.

The Fire Program purchased a 4X8 trailer used to haul the ATV which can also be used by the Refuge.

The excess vehicles added to the fleet include a 1992 Chevy dual wheel 3500 4X4. This was used to carry the YCC Crew all in one vehicle and the tools and equipment as well. A 1988 Dakota pick up was used by the Bio Tech to help with conducting her survey work as well as carrying nesting enclosures. The Chevy came from Petit Manan and the Dakota came from DRMO Portsmouth.

The vehicles that were excessed from this refuge were as follows: 1973 JD 301A, 1985 MI Camo Blazer, 1990 Jeep Cherokee. All three vehicles were sold through GSA Internet Auction. The benefits of this system included not having to take the vehicle anywhere. Each vehicle was sold as is. The sale was conducted by GSA.

A travel trailer from FEMA was delivered to the refuge. It is in excellent shape and resides next to the Houston property.

5. Communications Systems

The radio system received in 2002 has been determined to basically non-functional during the year. Part of the problem is that the base station antennae is below tree level, and the refuge is spread out over 50 miles. The installation and operation of a repeater or possibly two will be necessary and an appropriate site(s) will have to be located.

6. Computer Systems

Several desk tops were replaced during the year with lap tops and docking stations.. This now allows staff to take their computers on travel and have all their files with them. Several monitors were also replaced with flat screen monitors giving staff more desk space.

7. Energy Conservation

This refuge remains committed to conserving energy at each and every opportunity. The amount of metal that is taken to the local metal recycler remains in the hundreds of pounds per year. Over 40 pounds of aluminum was recycled in the form of refuge signs destroyed by vandalism. Our paper waste is recycled. We average 50 to 75 pounds per week. Our waste oil will be used by the Town of Wells Waste Transfer Station as a heating fuel. Common household batteries are recycled through the town of Kennebunk. A not so readily recognized source of mercury pollution in the form of heating switches are being changed out at the refuge and the old mercury containing switches are being recycled through our plumbing supply house at no c

J. OTHER ITEMS

3. Items of Interest

4. Credits